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NEW RECORDS OF LARGER FUNGI IN BULGARIA

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*We dedicate this paper
to Professor Dobrina Temniskova
with respect and gratitude on the
occasion of her eighty birthday*

Abstract: The paper reports 12 rare larger fungi from Bulgaria. All taxa belong to basidiomycetes. Three of them – *Climacodon septentrionalis*, *Limacella delicata* var. *vinosorubescens* and *Mycena flos-nivium* are new records for Bulgaria. Five species are of high conservation value, included in the Red List of fungi in Bulgaria. Most of the species are uncommon and endangered in Europe.

Key words: basidiomycetes, Bulgarian mycota, fungal conservation

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INTRODUCTION

During the last years data about rare and threatened larger fungi from Bulgaria were published by ALEXOV ET AL. (2012), ASSYOV ET AL., (2010, 2012), GYOSHEVA ET AL. (2012) and LACHEVA (2012a,b). They are important contribution to the study of the fungal diversity and its protection in the country, and especially to the more precise determination of threat status of species of high conservation value. However, more investigations in the country are still necessary. Therefore the aim of present paper is to enrich the information about rare and threatened larger fungi in Bulgaria with new data.

New data about the distribution of twelve uncommon and less known larger basidiomycetes are present as a result of author's investigations of the fungal diversity within the framework of several scientific projects in different regions in Bulgaria. Among them, three species are newly recorded for the country and five species are of high conservation value, included in the Red List of Bulgarian fungi (GYOSHEVA ET AL. 2006): *Calocybe ionides* (Bull.: Fr.) Donk., *Clavicornona pyxidata* (Pers. : Fr.) Doty, *Geastrum triplex* Jungh., *Grifolia frondosa* (Dicks. : Fr.) Gray and *Sarcodon leucopus* (Pers.) Maas Geest. & Nannf. Three of them are enlisted also in the Red Data Book of Republic of Bulgaria (PEEV ET AL. 2011).

MATERIAL AND METHODS

Fungal species were registered during the 2013–2014 period, mostly by the authors. The studied specimens are kept in the Mycological Collection of the Institute of Biodiversity and Ecosystem Research, Bulgarian Academy of Sciences (SOMF). Microscopic features were observed in water and 3% KOH under Amplival LM and in Lactophenol Cotton Blue stain under Leitz Laborlux S LM.

Author's name of fungal taxa are abbreviated according to KIRK & ANSELL (2004) and Index Fungorum. The threat status follows the Red List of fungi in Bulgaria (GYOSHEVA ET AL. 2006).

RESULTS

New larger basidiomycetes for Bulgaria.

***Climacodon septentrionalis* (Fr.) P. Karst.**, Rev. Mycol. Toulouse 3 (9): 20 (1881) (Plate I, Fig.1).

Basidiomata annual, pileate, often in abundant numbers, imbricate, forming large clusters. **Pileus** 5–10 (12) cm wide, 1,5–2 cm thick at the base, kidney or fan shaped, convex to flat, upper surface roughened, whitish, creamy to brownish in older specimens, margin enrolled when dry. Under surface with spines, 0,5–1 cm long, cylindrical, acute, whitish to brownish in age. **Context** whitish-cream, fibrous, smell not distinctive, unpleasant in dry specimens. **Hyphal system** monomitic.

Basidia 4-spored, slender. **Basidiospores** 3,5–5 x 1,5–2 µm, ellipsoid, smooth, hyaline. **Cystidia** 35–45 x 12–15 µm, cylindrical, fusoid, mucronate at the apex, thick-walled (Plate I, Fig.2).

Specimen examined. Mt Strandzha, 1 km north of Kondolovo village at 350 m a.s.l., on living stem of *Fagus orientalis* LIPSKI, 22.11.2013, leg. T. NEDELIN, det. M. GYOSHEVA (SOMF 29643).

Climacodon septentrionalis is parasite on trunks of living deciduous trees (mostly from genera *Acer* L., *Alnus* Mill., *Betula* L., *Fagus* L., *Fraxinus* L., *Populus* L., etc.). The species is distributed in Europe, Asia, North America. In Europe it occurs exceptionally in the northernmost regions.

C. septentrionalis is rare and very rare in the Central and Southern Europe (NIKOLAEVA 1961; KOSKI-KOTIRANTA & NIEMALÄ 1987).

Limacella delicata var. *vinosorubescens* (Furrer-Ziogas) Gminder, Z. Mykol. 60 (2): 386 (1994) (Plate I, Fig. 3).

Pileus up to 7 cm in diameter, convex to flat, or slightly depressed in the center, umbonate, slimy, moist, later finely scaly, wine-red, discoloured to cream-pink. Margin initially incurved. **Stipe** 5–8 x 1–2 cm, cylindrical, with whitish annular zone, soon fugaceous, surface smooth, whitish to pinkish to the apex, fine pink-fibrous at the base. **Context** creamy to pink-reddish. Smell farinaceous. **Gills** free, broad, whitish, cream-pink, vinaceous pink spotted in old specimens. **Basidia** 4-spored, cylindrical. **Basidiospores** 3,5–5 x 3–4,5 µm, subglobose, smooth, hyaline. **Cystidia** absent.

Specimen examined. Northern Pirin Mts, near Gotse Delchev chalet, above Dobrinishte town, at 1500 m a.s.l., in mixed wood (*Fagus sylvatica* L., *Picea abies* (L.) Karst., *Abies alba* Mill.), 31.07.2014, leg. & det. M. GYOSHEVA (SOMF 29645).

Limacella delicata var. *vinosorubescens* is an uncommon fungus with high conservation value (COURTECUISSÉ & DUHEM 1994; PHILLIPS 2006). It occurs in deciduous (oak, beech) and mixed woods (beech, spruce), July–November. In Europe the species is distributed exceptionally in northern, western and central regions (GMINDER 1994; COURTECUISSÉ & DUHEM 1995; KRIEGLSTEINER 2003).

Mycena flos-nivium Kühner, Bull. Soc. Nat. Oyonnax 6: 71 (1952) (Plate I, Fig. 4).

Pileus up to 2 cm in diameter, convex to almost flat, surface smooth, hygrophanous, radially striate up to halfway, dark grey-brown to pale-brown. **Stipe** 3–4 x 0,2–0,25 cm, cylindrical, smooth, hollow, grey-brownish, white to the apex, base white-strigose. **Context** thin, white. Smell not distinctive. **Gills** broad, ventricose, some with anastomoses, whitish to whitish-grey. **Basidia** 4-spored, clavate. **Basidiospores** 7–11 (11,5) x 4–5 µm, cylindrical ellipsoid, smooth, hyaline, guttulate. **Cheilocystidia** clavate. **Pileipellis** consisting of distinctly branched, gnarled hyphae, 2–4 µm thick.



Plate I: (Figs. 1–6): 1 – *Climacodon septentionalis* – cluster of fruit bodies; 2 – *Climacodon septentionalis* – hymenium with cystidia; 3 – *Limacella delicata* var. *vinosorubescens* – fruit body; 4 – *Mycena flos-nivium* – fruit body; 5 – *Sarcodon leucopus* – fruit bodies; 6 – *Sarcodon leucopus* – basidiospores and hymenium.

Specimen examined: Northern Pirin Mts, near Peyo K. Yavorov chalet, above Razlog town, 1815 m a.s.l., in mixed coniferous forest (*Picea abies* (L.) Karst.,

Pinus peuce Griseb., *P. heldreichii* Christ.), on rotten stump of spruce, 10.05.2014, leg & det. M. GYOSHEVA (SOMF 29644).

Mycena flos-nivium is an uncommon species. It is saprotrophic fungus on dead wood and in forest litter under conifers in mountains, March-May. The species is distributed in Europe and North Asia (KRIEGLSTEINER 2001).

New localities of rare larger basidiomycetes to Bulgaria

***Agaricus bresadolianus* Bohus**

Specimen examined. Northern Black Sea Coast, Botanical Garden, Balchik town, on soil among grasses, 15.10.2013, leg. V. VLADIMIROV, det. M. GYOSHEVA (SOMF 29654).

The species was reported so far only from Thracian Lowland (DENCHEV & ASSYOV 2010).

***Calocybe ionides* (Bull. : Fr.) Donk.**

Specimen examined. Central Rodopi Mts, Chervenata Stena Reserve, above Bachkovo monastery, in beech forest, in the litter, 11.04.2014, leg. A. GANEVA, det. M. GYOSHEVA (SOMF 29650).

The species is included in the Red List of fungi in Bulgaria under category *Data Deficient* (DD), known from Southern Black Sea coast – Ropotamo Reserve and Central Rodopi Mts – near Dedovo village (Kuthan & Kotlaba 1981; Stoichev 1982).

***Cantharellus amethysteus* (Quél.) Sacc.**

Specimen examined. Northern Pirin Mts, near Gotse Delchev chalet, above Dobrinishte town, at 1500 m a.s.l., in mixed wood of *Fagus sylvatica* and *Picea abies*, 31.07.2014, leg. & det. M. Gyosheva (SOMF 29655).

Rarely recorded species, so far known from Western and Central Stara Planina Mts (ASSYOV *ET AL.* 2012; DENCHEV & ASSYOV 2010).

***Clavicornia pyxidata* (Pers. : Fr.) Doty**

Specimen examined. Tundzha Hilly Country, in Dolna Topchiya managed Reserve, north of Elhovo town, in riparian forest, on dead deciduous wood, 21.05.2014, leg. T. MESHINEV, det. M. GYOSHEVA (SOMF 29649).

Critically Endangered (CR) species, so far known from the Central and Eastern Stara Planina Mts, Vitosha Mt, Rila Mts and Western Rodopi Mts (DENCHEV & ASSYOV 2010; PEEV *ET AL.* 2011).

***Geastrum triplex* Jungh.**

Specimen examined. Northern Pirin Mts, 250 m southwest from Banderitsa chalet, near Baykusheva mura, 1900 m a.s.l., under *Pinus heldreichii*, 22.09.2014, leg. T. NEDELIN, det. M. GYOSHEVA and T. NEDELIN (SOMF 29651).

The species is included in the Red List of Bulgarian fungi under category *Vulnerable* (VU). It is known from Black Sea coast, Sofia region – Lyulin Mt, Vitosha Mt, Central Rodopi Mts (ASSYOV ET AL. 2010; DENCHEV & ASSYOV 2010).

***Grifola frondosa* (Dicks. : Fr.) Gray**

Specimen examined. Sofia region – Sofia city, Vrana park, 565 m a.s.l., at the base of a living trunk of *Quercus robur* L., 04.11.2014, leg. A. PENCHEVA, det. T. NEDELIN (SOMF 29647).

Endangered (EN) species. In Bulgaria known from the Western and Central Stara Planina Mts and Znepole region – Golo Bardo Mt (DENCHEV & ASSYOV 2010; PEEV ET AL. 2011).

***Rhodotus palmatus* (Bull. : Fr.) Maire**

Specimen examined. – Tundzha Hilly Country, in Dolna Topchiya managed Reserve, north of Elhovo town, on the bank of Tundzha River, on rotten stump of *Ulmus minor* MILL., 21.05.2014, leg. T. MESHINEV, det. M. GYOSHEVA (SOMF 29648).

The species is rare to very rare in Europe, with high conservation value. It occurs exclusively on dead wood of *Ulmus* spp. (COURTECUISE & DUHEM 1994; KRIEGLSTEINER 2001; PHILLIPS 2006; SHNITTLER 1996). This species has been reported only once in Bulgaria, from Vitosha Mt – Zlatnite mostove locality, on dead beech wood (BARSAKOV 1926).

***Sarcodon leucopus* (Pers.) Maas Geest. & Nannf. (Plate I, Figs. 5–6; Fig. 7).**

Specimen examined. Western Rodopi Mts. – 1,3 km. southeast under Yundola village, along the road to Velingrad town, 1320 m a.s.l., under *Pinus sylvestris*, 11.09.2014, leg. and det. T. NEDELIN (SOMF 29646).

Critically Endangered (CR) species. Reported so far from Pirin Mts, above Razlog town and Western Rodopi Mts, above Dospat town (DENCHEV & ASSYOV 2010; PEEV ET AL. 2011).

***Suillus lakei* (Murrill) A. H. Sm. & Thiers**

Specimen examined. Northern Black Sea Coast, Botanical Garden, Balchik town, under *Pseudotsuga menziesii* (Mirb.) Franco, 15.10. 2013, leg V. VLADIMIROV, det. M. GYOSHEVA (SOMF 29652).

The species is so far known from Western Stara Planina Mts, West Frontier Mts – Ograzhden Mt and Central Rodopi Mts (ASSYOV ET AL. 2010; ALEXOV ET AL. 2012; LACHEVA 2012A).

Suillus lakei is mycorrhizal fungus with *Pseudotsuga* spp. It was reported from Bulgaria only in *Pseudotsuga menziesii* cultures.



Fig.7. *Sarcodon leucopus* – Map of locality in Western Rodopi Mts.

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